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## CENTRAL INTELLIGENCE AGENCY

## INFORMATION REPORT

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COUNTRY	USSR (Moscow Oblast)	REPORT NO.		25X1
SUBJECT	Target-Seeking Device Developed at Special Bureau No. 1 of NII-885 in Monino	DATE DISTR.	15 January 1954	
		NO. OF PAGES	9	
DATE OF INFO.		REQUIREMENT NO.		25X1
PLACE ACQUIRED		REFERENCES		25X1

1. The target-seeking device developed at Special Bureau No. 1 of NII-885 in Monino, USSR, was a usable basis for further development. However, [redacted] about three more years of very intensive designing and development work were required in order to make the device ready for operation.

2. [redacted] The receiver antenna had a directivity of  $\pm$  six degrees. Because of the eccentric arrangement of the rotating dipole, the direction of maximum reception slanted by three degrees in relation to the axis of symmetry of the antenna reflector. An armature with two coils was fitted on the axle of the dipole to produce the reference voltage. The intensity modulation of the rays received was compared to this reference voltage by means of two-phase bridges and, thus, the control power required for the follow-up control mechanism of the cardan motor was obtained for two coordinate directions.

3. The mixer in the head of the set was composed of a copper block, which contained two cavity resonators for the receiving frequency (antenna filter) and the oscillator frequency respectively and a crystal detector. The first intermediate frequency of 40 mc was amplified about 5,000 times by an intermediate frequency amplifier and then mixed with a second oscillator frequency of 70 mc. The second intermediate frequency obtained was 30 mc. An LD-12-type tube was used for the first oscillator and a 6AC7-type tube was used in the intermediate frequency amplifier.

4. Experiments with the device, which was completed by late 1949, were started in 1950. The gimbal-mounted target-seeking head was at first adjusted by means of an SCR-584 type radar. The coordinates obtained by the radar were converted by a computer, which had been specially developed for this purpose, and transmitted to the control mechanism of the target-seeking head until it located the target itself.

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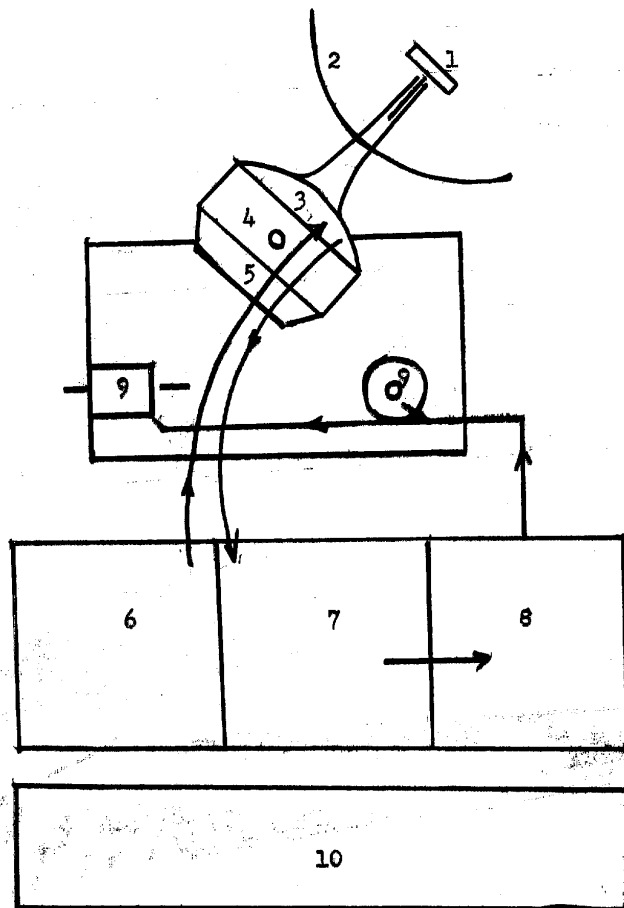
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(Note: Washington Distribution indicated by "X".)

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Switching Diagram of the Target-Seeking DeviceKey to Sketch:

1. Rotating dipole.
2. Receiver antenna reflector.
3. Mixing unit.
4. Gyro engine.
5. Generator for reference voltage.
6. First oscillator.
7. Intermediate frequency amplifier.
8. Production of control impulses.
9. Motors for follow-up of antennas.
10. Power unit.

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5. The Soviets did not request any modifications in the design of the device. Since vibration and acceleration tests could not be conducted, it was not always possible to consider the acceleration resistance of the device during the designing.
6. The following instruments were developed at Special Bureau No. 1 between July 1951 and the time when it was closed:
  - a. Quartz clock (oscillator) with an accuracy of  $10^{-8}$  for frequencies of 100 kc/s, 10 kc/s, 1 kc/s, 100 c/s, 10 c/s, and 1 c/s. One year of continuous operation was guaranteed for the clock. The set included a tone alternator for 1-5,000 c/s with an accuracy of one percent, a measuring receiver for 20 kc/s - 25 mc/s, a wavemeter for 100 mc/s with an accuracy of  $10^{-6}$ , an oscillograph for the exact comparison of frequencies 220 volts, and 50 kc/s power unit for the quartz clock; which made it possible to switch the clock without any delay from the main power line to an auxiliary battery, when the power failed.
  - b. Wide band amplifier, 100 kc/s - 200 mc/s.
  - c. Heterodyne wavemeter, 1 mc/s - 3,000 mc/s, with reduction to crystal frequency.
  - d. Standard signal generator, 30 - 1,000 mc/s.
  - e. Amplifier with acoustic resonance utilizing the modulation of the receiver carrier for antenna measuring.
  - f. Frequency wide band power amplifier (sic)..
  - g. Jolting machine.
  - h. DC amplifier.
  - i. Scale graduation cutting device for linear, logarithmic, and square scale graduation from two measuring points (messpunkt).
7.  the target-seeking device was merely an experimental unit which was constantly being improved by Bushbeck. The cubic light-metal casing had two higher side walls to which the reflector was fixed by means of cardanic suspension. The azimuth and vertical axes were operated by the control mechanism, each via a gear ring with a spacing of two to three mm. The hemispherical mixer just below the reflector was connected to the first oscillator step and the intermediate frequency unit installed in the cast casing by means of a flexible high frequency cable with a maximum length of 20 cm.

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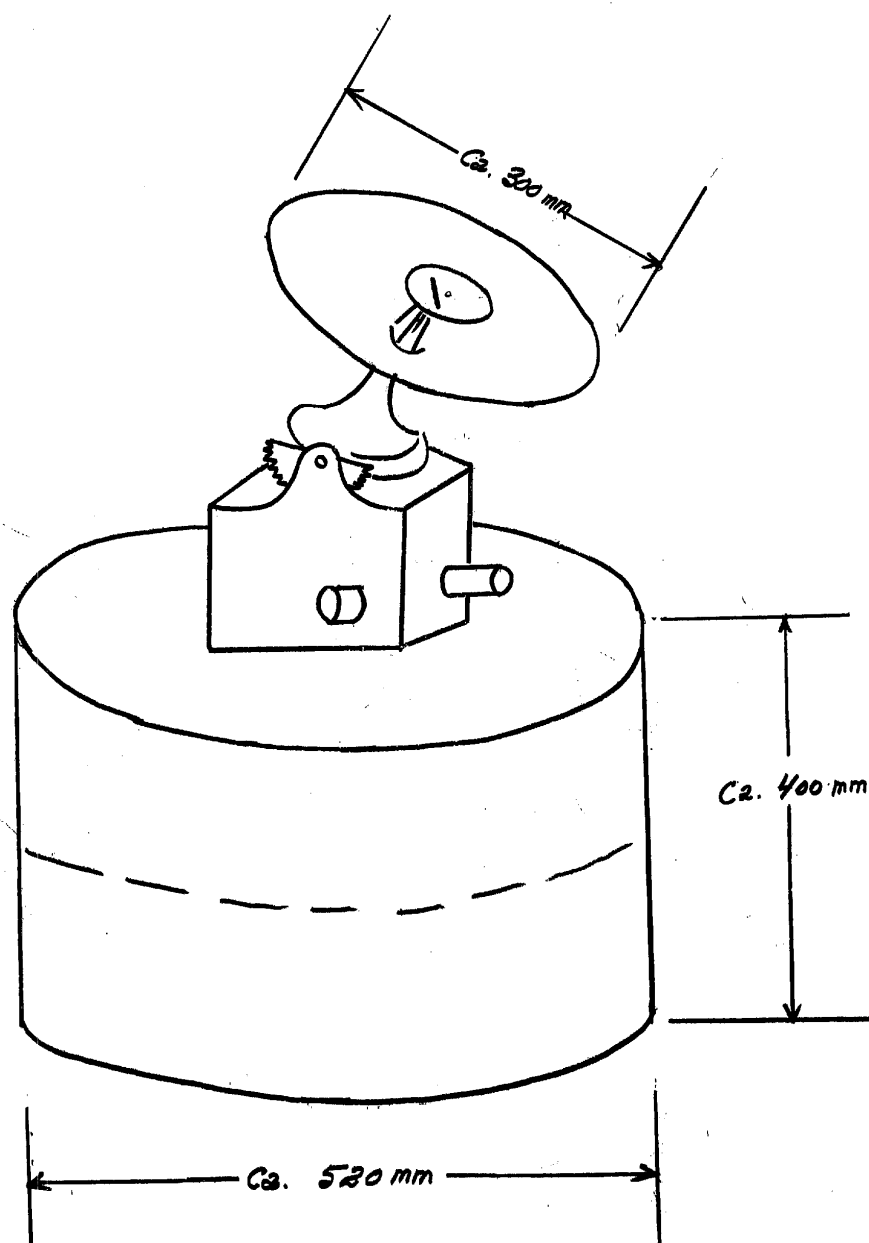
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Cardanic Suspended Head of the Target-Seeking Device

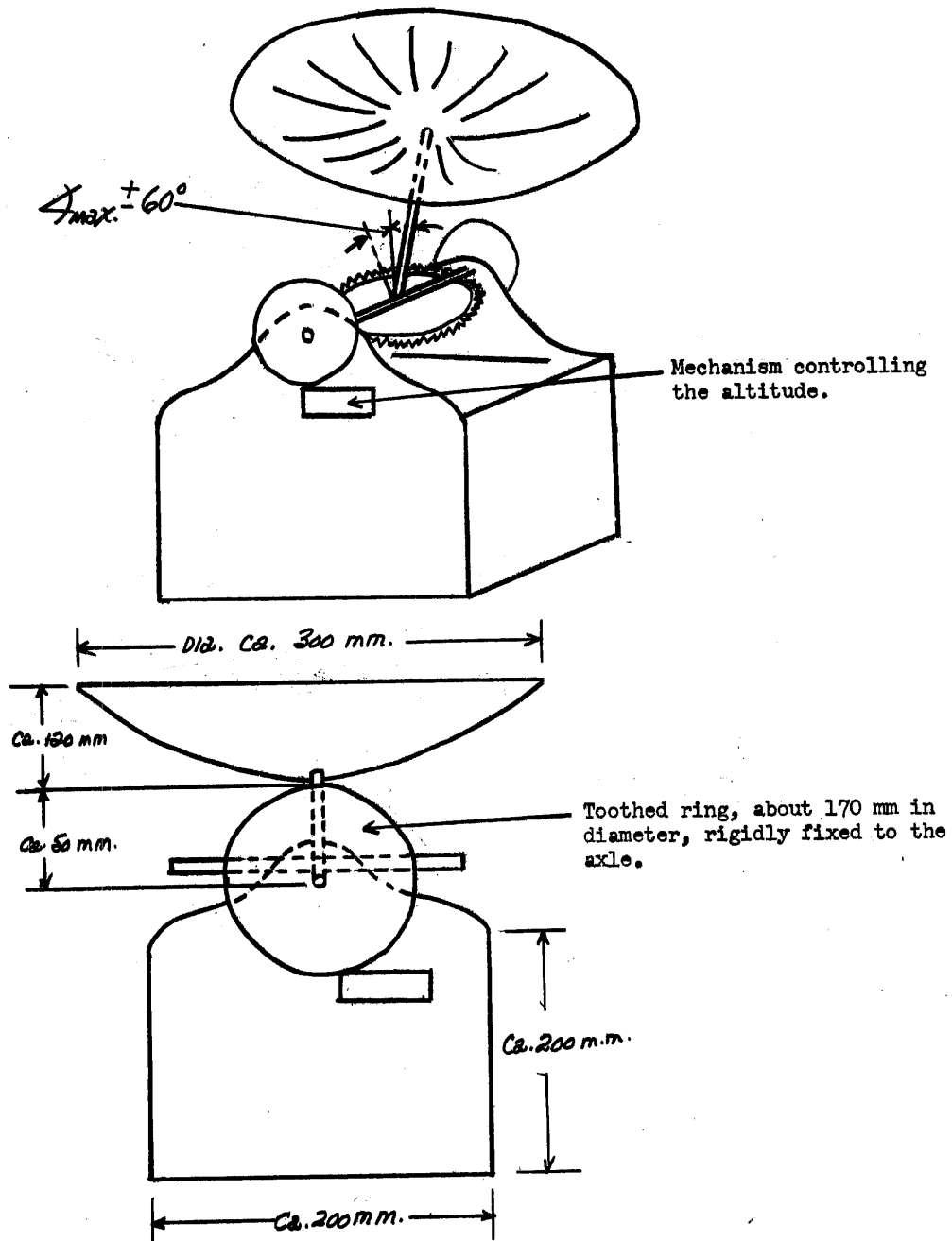


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Head of Target-Seeking Device

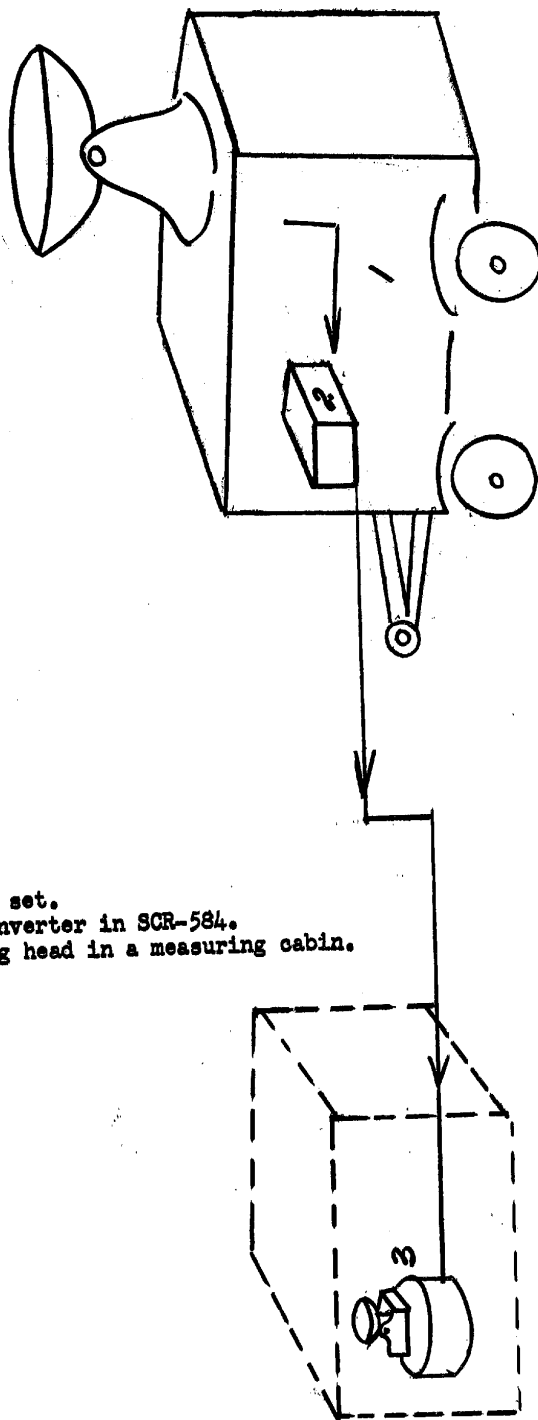
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Schematic View of the Experimental Setup of the  
Target-Seeking Device



Key to Sketch:

1. SCR-584 radar set.
2. Coordinate converter in SCR-584.
3. Target-Seeking head in a measuring cabin.

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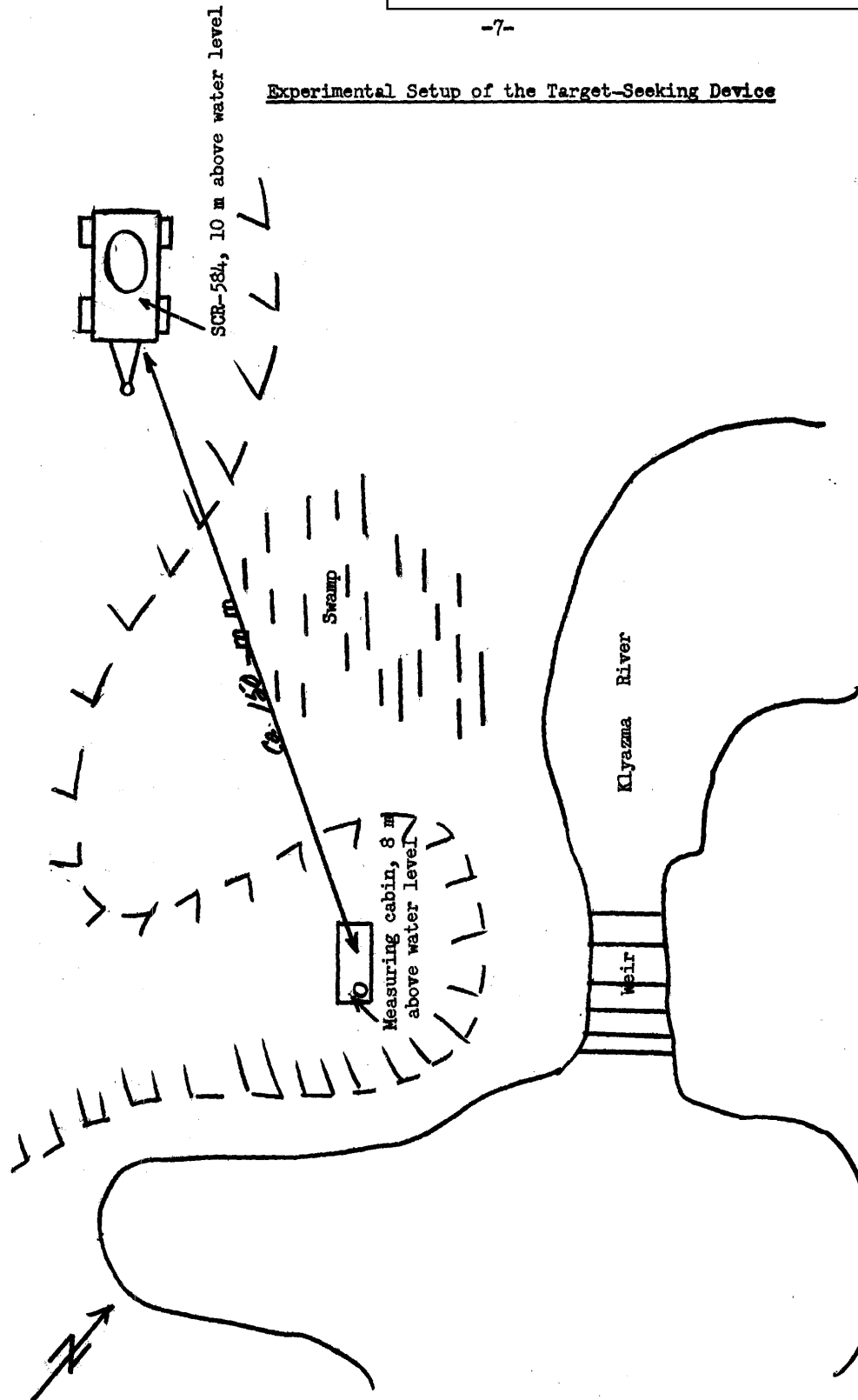
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Experimental Setup of the Target-Seeking Device

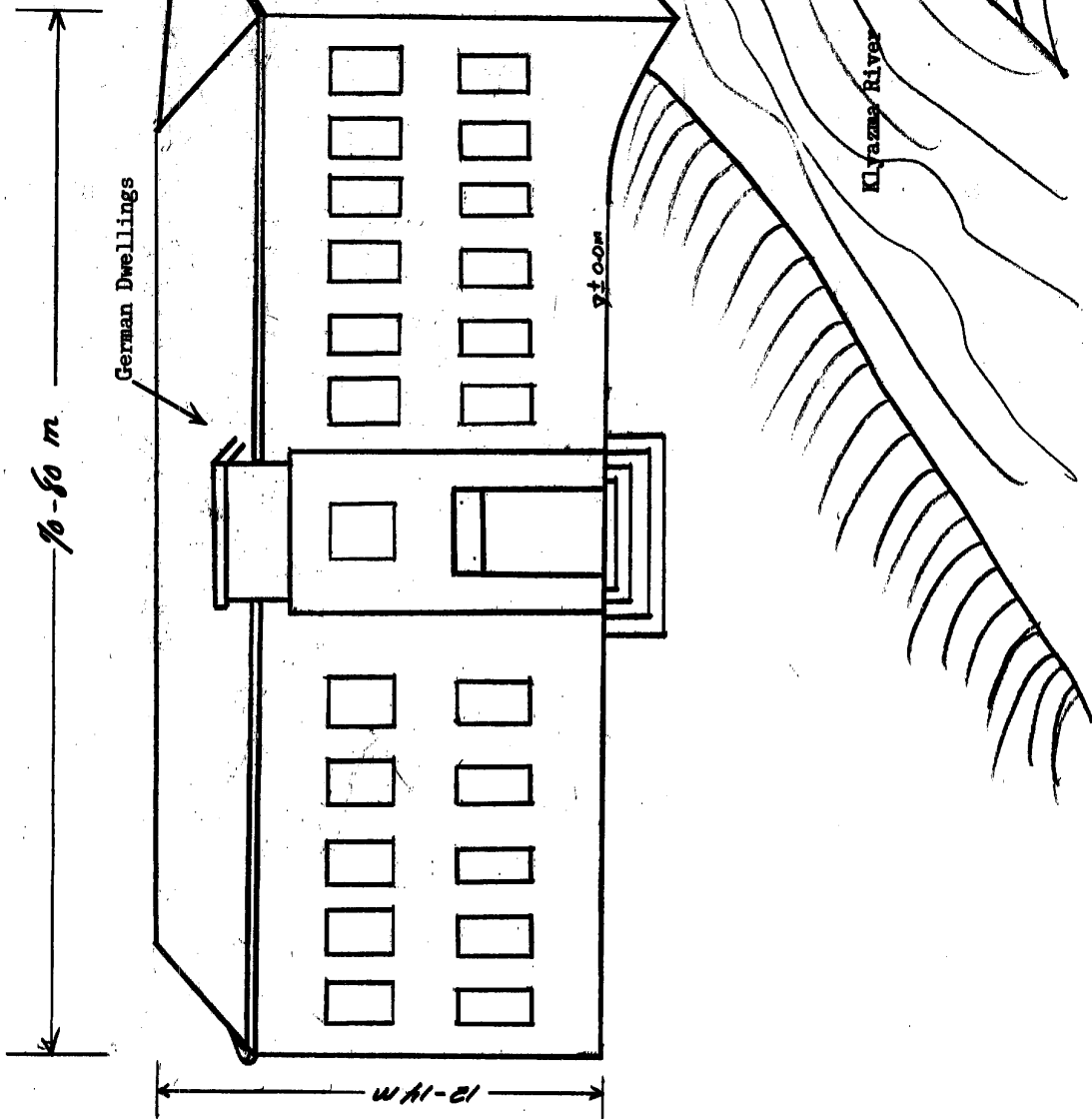


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Front View of Special Bureau No. 1 at Monino



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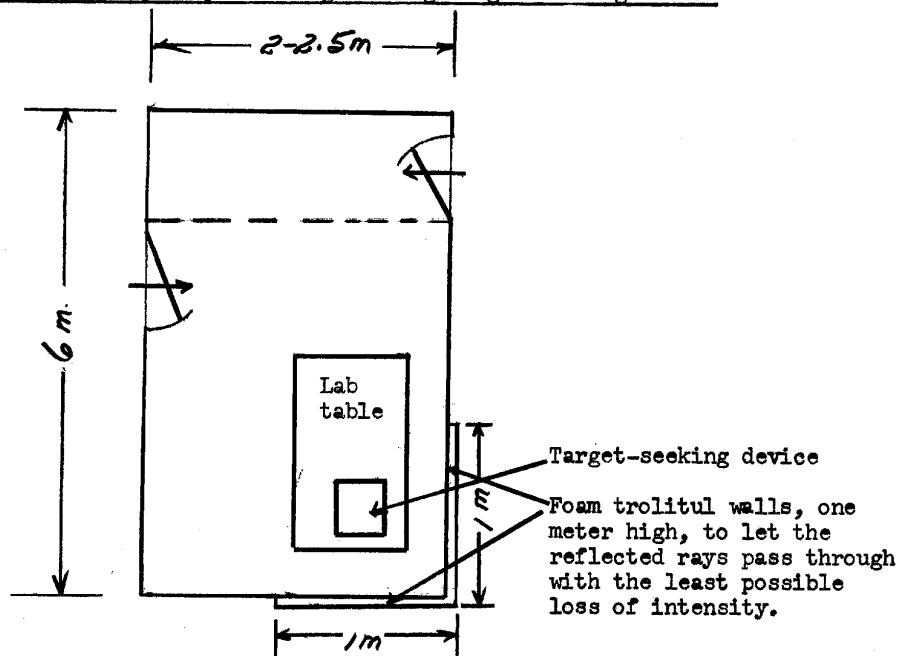


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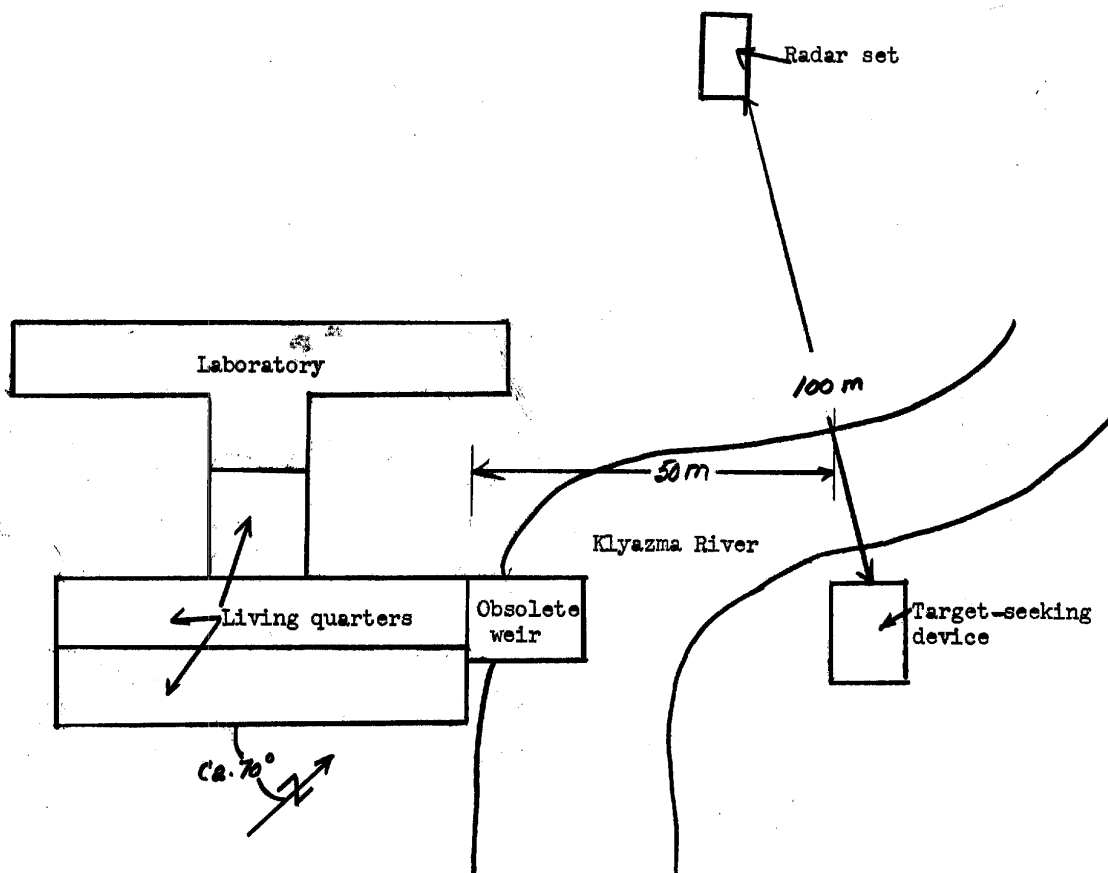
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Layout of Temporary Building Housing Target-Seeking Device



Layout of Special Bureau No. 1 at Monino



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